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| EXAMINER | |
|---|---|
| HORNING, JOEL G | |
| ART UNIT | PAPER NUMBER |
| 1792 | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/517,556 | KRONSEDER ET AL. | |
| | Examiner | Art Unit | |
| | JOEL G. HORNING | 1792 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *13 January 2009*.

2a)☒ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) *7-12* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 13-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12-23-08*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Election/Restrictions*

Claims 7-12 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 01-13-2009.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1. Claims 1,5,6 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maruhashi et al (US 4393106) in view of Heiremans et al (US 4181239) in view of Pocock et al (US 4534995).

**Claim 1** is directed towards a method for manufacturing hollow bodies with gas barrier coating agent based upon polyvinyl alcohol wherein said hollow bodies are:

a. pretreated to increase surface energy

b. electrostatically discharging the surface

c. coating the surface

d. drying the surface

Maruhashi et al teach a process for manufacturing hollow bodies with gas barrier coatings (abstract and col 1, lines 6-18) wherein the hollow body is given a preliminary treatment to increase the substrate surface energy (increase wetting), such as a corona discharge treatment (col 10, lines 33-38). After the pretreatment, the hollow body is coated with a barrier layer material (col 10, lines 26-33). The coated material is then dried (col 11, lines 19-24). Maruhashi et al's goal is to produce a body with excellent gas barrier layer properties (col 1, lines 6-18) and teach the use of and effectiveness of many different materials (table 1), but they do not specifically teach using polyvinyl alcohol as the barrier coating material.

However, Heiremans et al teach the use of polyvinyl alcohol as a gas barrier layer coating for hollow bodies. They teach that polyvinyl alcohol has an oxygen permeability of 6.24 X $10^{-17}$ ml.cm/$cm^2$ sec.cmHg (col 4, line 47), which is more than two orders of magnitude better oxygen resistance than any barrier material listed in Table 1 of Maruhashi et al.

Thus it would have been obvious to a person of ordinary skill in the art at the time of invention to use a polyvinyl alcohol based coating as the barrier coating on the hollow bodies in order to improve the hollow bodies barrier property or in order to use thinner barrier films.

Furthermore, Pocock et al teach a method for treating hollow bodies to improve their barrier properties. In that method they teach that positively charged containers will collect dust from the air, which results in imperfections in the coating. They teach that conditioning the container with ionized air (electrostatically discharging it) before depositing the barrier coating will give the container a slightly negative charge and avoid this problem. (col 2, lines 45-56).

Thus it would have been obvious to a person of ordinary skill in the art at the time of invention to electrostatically discharge the container before applying the barrier coating in order to reduce imperfections in the coating.

Regarding **claim 5**, Maruhashi et al teach that coating can be performed by spraying (blowing) the coating agent against the hollow body (col 10, lines 26-29).

Regarding **claims 6 and 15**, Maruhashi et al teach that the appropriate drying process conditions are changed depending upon the thickness of the coating layer, and

that drying at a temperature range between 40°C and 160°C is usually sufficient. This overlaps with applicants claimed temperature ranges. In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). Heiremans et al teach that polyvinyl alcohol is sensitive to humidity with a decrease in its barrier properties towards oxygen with increasing absorption of humidity (col 5, lines 9-15).

Thus it would have been obvious to a person of ordinary skill in the art at the time of invention to dry the polyvinyl alcohol coating using an environment with no moisture present in order to avoid degrading the barrier layer properties of the coating. This of course falls within the claimed range of less than 3 $g/m^3$ of water.

2. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maruhashi et al in view of Heiremans et al in view of Pocock et al as applied to claim 1 above, and further in view of Kuckertz et al (US 6613394).

**Claim 3** requires that the method of increasing the surface energy is by flaming.

As stated above, Maruhashi teaches the use of different methods including a corona discharge treatment to increase the surface energy of the hollow body, but Maruhashi et al in view of Heiremans et al in view of Pocock et al does not specifically teach flaming.

However, Kuckertz et al teach that corona discharge methods have disadvantages, like the production of pin holes in the coatings (col 3, lines 19-21) and electrostatic charging. They teach that their method of exposing the surface to "an

atmospheric plasma generated by an indirect plasmatron" avoids this disadvantage while still increasing surface energy (improving wettability) and increasing adhesion (col 4, lines 6-24). The surface to be treated is exposed to hot plasma with process gas/aerosol, which is a flaming process (col 7, lines 15-26).

Thus it would have been obvious to a person of ordinary skill in the art at the time of invention to use a flaming process instead of a corona discharge method in order to avoid electrostatic charging and pin holes in the coatings while still increasing the surface energy and improving adhesion of the coating deposited afterwards.

Regarding **claim 2**, when the treated surface is polyethylene teraphthalate (PET), the flaming process will increase the surface energy to 62-64mN/m (table 2).

3. Claims 4 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maruhashi et al in view of Heiremans et al in view of Pocock et al as applied to claim 1 above, and further in view of Hostettler et al (US 6017577).

**Claim 4** further requires an additional preliminary treatment of the surface with a fat dissolving agent before the surface energy increasing treatment. Maruhashi et al in view of Heiremans et al in view of Pocock et al teach the production of polymeric hollow bodies (for examples, the abstract of Maruhashi). As stated above, they teach plasma treatments on those substrates, like corona discharge to increase their surface energy, but they do not teach a treatment before the plasma treatment.

However, Hostettler et al teach that "it is often advantageous to pretreat the polymeric substrate surface before plasma treatments with polar or nonpolar organic solvents... in order to remove any surface impurities..."(col 9, lines 62-66). These

surface impurities can interfere with the plasma treatment (col 10, lines18-19). Hostettler et al teach using ethyl alcohol (ethanol) as a suitable solvent **(claim 14)**, Which, since claim 14 depends upon claim 4, must be a "fat dissolving agent."

Thus it would have been obvious to a person of ordinary skill in the art at the time of invention to treat the surface of the hollow body with ethyl alcohol before the plasma treatment in order to remove impurities that could interfere with the efficacy of the plasma treatment.

Claim 2 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maruhashi et al in view of Heiremans et al in view of Pocock et al as applied to claim 1 above, and further in view of Vitos et al Surf. Sci. 411 (1998), p. 186).

Claim 2 requires that the surface energy be increased above 60mN/m and claim 13 further requires that the surface energy be increased to above 70mN/m. As discussed above, increasing the surface energy improves the wettability and adhesion of coatings on that surface, however, Maruhashi et al in view of Heiremans et al in view of Pocock et al do not teach this surface energy.

However, Vitos et al teach that certain single crystal surfaces of metals can have very high surface energies. For instance, the (110) surface of BCC iron has been experimentally found to have an energy of 2,417mN/m (Table 5).

Knowing this, it would have been obvious to a person of ordinary skill in the art at the time of invention to construct a hollow body of bcc iron with an outer surface comprising the (110) surface. Such a person would have been motivated to do so in

order to enjoy much greater wettability and adhesion of the gas barrier coating than could be obtained by a polymer surface.

***Response to Arguments***

Applicant's arguments filed 01-13-2009 have been fully considered but they are not fully persuasive. In response to the amendments of claim 13 and 15, the 112 2nd rejections have been withdrawn. Additionally, the amendment to claim 13 has necessitated changes in the rejection of that claim in order to accurately reflect the amended claim limitations.

In regards to applicant's argument that Maruhashi does not teach discharging the conductively treated surface, the examiner notes that applicant's argument that conductive treatments is well known to be a preparatory step for electrostatic coating processes, indicates that applicant understood that the substrate would be brought into contact with a device which would change the potential of the surface, thus discharging it (electrostatic coating processes control the substrate surface potential to at least ensure that surface does not become charged and repel the charged coating material). However, the examiner agrees that sufficient evidence was not previously included in the record to substantiate this particular point. In response to this, this particular argument has been deleted. This does not overcome the rejection, because the discharging feature was also rejected through Pocock.

In response to applicant's argument that Pocock does not teach increasing the surface energy of the surface prior to electrically discharging it. This is an argument

against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

As stated in the office action, Pocock teaches discharging the surface, so it is neutralized for the coating process, in order to reduce surface defects in the coating (col 2, lines 45-56). Thus it would have been obvious to a person of ordinary skill in the art at the time of invention to modify the process of Maruhashi by discharging the surface prior to deposition. Such a person would have been motivated to do since it was taught that this would reduce surface defects in the coating.

Applicant further argues that "...an increase in surface energy is exactly what Pocock is trying to combat." However, applicant does not supply any citation in Pocock or reference or even reasoning to support this conclusion about Pocock, so the argument is not convincing.

In response to applicant's argument that nothing suggests a need to desire for the container to be electrostatically discharged, as discussed previously, Pocock teaches such an electrostatic discharging step to be desirable for the reduction in the surface defects of the coating, so the argument is not convincing.

***Conclusion***

**No current claims are allowed.**

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOEL G. HORNING whose telephone number is (571) 270-5357. The examiner can normally be reached on M-F 9-5pm with alternating Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael B. Cleveland can be reached on (571)272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. G. H./
Examiner, Art Unit 1792

/Michael Cleveland/
Supervisory Patent Examiner, Art Unit 1792